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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,205	11/26/2001	Takeshi Okamura	81716.0081	9553

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EXAMINER	
GLENN, KIMBERLY E	

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 02/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/995,205	Applicant(s) OKAMURA ET AL.	
	Examiner Kimberly E Glenn	Art Unit 2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-17 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-17 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1- 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanizaki et al US Pat. 5,982,255 (of record).

Tanizaki et al disclose a non-radiative dielectric waveguide comprising: a pair of parallel planar conductors (9 and 10) arranged at an interval of half or below of a high-frequency signal wavelength; and a dielectric strip 15 interposed between the parallel planar conductors, the dielectric strip 15 having a chamfer formed at an edge portion in a transmission direction of the dielectric strip. The chamfer is formed as a flat surface, and one width of the chamfer corresponding to a surface of the dielectric strip facing to the parallel planar conductor

is made larger than the other width corresponding to a side surface of the dielectric strip.(see figure 17b and column 8 lines 51-65)

Thus Tanizaki et al is shown to teach all the limitations of the claim with the exceptions of the chamfer being .01 to .3 mm wide and the chamfer having a convexly curved surface.

One skilled in the art, at the time of the invention, would have it obvious for the chamfer to be .01 to .3 mm wide and for the chamfer to have a convexly curved surface in for the dielectric strip to conform to the grooves in the conductive plates.

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanizaki et al 5,982,255 (of record) in view of Fujimaru et al US Pat. 5,246,898.

Tanizaki et al disclose a non-radiative dielectric waveguide comprising: a pair of parallel planar conductors 9 and 10 arranged at an interval of half or below of a high-frequency signal wavelength; and a dielectric strip 15 interposed between the parallel planar conductors, the dielectric strip being made of a ceramics.

Thus Tanizaki et al is shown to teach all the limitation of the claims with the exception of the ceramic having an open pore ratio of 5% or less (or 3% or less).

Fujimaru et al shows a ceramic having open pore ratio being 7% or less. Fujimaru et al teach there is no need for performing sintering for long hour. As a result, reduction in the manufacturing cost can be achieved and dielectric ceramic having a higher Q can be manufactured stably. (Column 3 line 7-29)

One skilled in the art at the time of the invention would have found it obvious to have the open pore ratio of 5% or less (or 3% or less), since it have been held that where the general condition

of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves routine skill in the art.

Claims 6-8 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanizaki et al 5,982,255 (of record) in view of Kii et al 6,437,663.

The primary reference Tanizaki et al disclose a non-radiative dielectric waveguide comprising: a pair of parallel planar conductors (9 and 10) arranged at an interval of half or below of a high-frequency signal wavelength; and a dielectric strip 15 interposed between the parallel planar conductors, the dielectric strip having a chamfer formed at an edge portion in a transmission direction of the dielectric strip.

Thus Tanizaki et al is shown to teach all the limitations of the claims with the exceptions of the ceramic including a complex oxide comprising Mg, Al and Si as a main components and having a Q value of 1000 or above at a measured frequency of 60 GHz and the composition of the complex oxide by mole ratio is expressed by the following formula: $xMgO - yAl_2O_3 * zSiO_2$ (wherein x, y and z are numbers satisfying the $x + y + z = 100$ mole %, x representing 10 to 40 mole %, y representing 10 to 40 mole and z representing 20 to 80 mole %).

Kii et al shows that is well known in the art for a ceramic to include a complex oxide comprising Mg, Al and Si as a main component and having a Q value of 1000 or above at a measured frequency of 60 GHz. (Column 16 line 8 through column 17 line 42)

One skilled in the art at the time of the invention would have found it obvious to have the ceramic include a complex oxide comprising Mg, Al and Si as a main component and having a Q value of 1000 or above at a measured frequency of 60 GHz, since theses material exhibit low losses at high frequencies.

Claims 9, 10, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanizaki et al 5,982,255 (of record) in view of Fujimaru et al US Pat. 5,246,898 in view of Kii et al US Pat. 6,437,663.

The primary references, Tanizaki et al and Fujimaru et al disclose a non-radiative dielectric waveguide comprising: a pair of parallel planar conductors arranged at an interval of half or below of a high-frequency signal wavelength; and a dielectric strip interposed between the parallel planar conductors, the dielectric strip being made of a ceramics having an open pore ratio of 5% or less (or 3% or less).

Thus Tanizaki et al and Fujimaru et al are shown to teach all the limitations of the claims with the exception of the ceramic including a complex oxide comprising Mg, Al and Si as a main components and having a Q value of 1000 or above at a measured frequency of 60 GHz and the composition of the complex oxide by mole ratio is expressed by the following formula: xMgO - yA1203 * ZSi02 (wherein x, y and z are numbers satisfying the x + y + z = 100 mole %, x representing 10 to 40 mole %, y representing 10 to 40 mole and z representing 20 to 80 mole %).

Kii et al shows that is well known in the art for a ceramic to include a complex oxide comprising Mg, Al and Si as a main component and having a Q value of 1000 or above at a measured frequency of 60 GHz. (Column 16 line 8 through column 17 line 42)

One skilled in the art at the time of the invention would have found it obvious to have the ceramic include a complex oxide comprising Mg, Al and Si as a main component and having a Q value of 1000 or above at a measured frequency of 60 GHz, since theses material exhibit low losses at high frequencies.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kii et al in view of Tanizaki et al US pat. 5,982,255 (of record) in view of Fujimaru et al US Pat. 5,246,898 in view of Nagao US Pat. 4,205,281.

Kii et al disclose a transmitting/ receiving apparatus comprising: a pair of parallel planar conductors 1 and 3 arranged at an interval of half or below of a millimeter wave signal wavelength; a first dielectric strip having at its one end a high-frequency diode oscillator 37a 37b , the first dielectric strip propagating a millimeter wave signal outputted from the high-frequency diode oscillator; a variable capacitance diode 30 for outputting the millimeter wave signal as a frequency modulated transmission millimeter wave signal, by periodically controlling a bias voltage of the variable capacitance diode, the variable capacitance diode being arranged such that a direction in which the bias voltage is applied coincides with a direction of an electric field of the millimeter wave signal; a second dielectric strip 75, one end of the second dielectric strip being disposed near the first dielectric strip so as to be electromagnetically coupled, or being joined to the first dielectric strip, the second dielectric strip propagating part of the millimeter wave signal toward a mixer; a circulator 76 having a first connection portion, a second connection portion, and a third connection portion, a third dielectric strip 77 for propagating the millimeter wave signal, the third dielectric strip being joined to the second connection portion of the circulator and having a transmitting/receiving antenna disposed at its front end; a fourth dielectric strip 81 for propagating a received wave that is received by the transmitting/receiving antenna, propagated along the third dielectric strip, and outputted from the third connection portion of the circulator, toward the mixer; (a fifth dielectric strip 113 connected to the third connection portion of the circulator, the fifth dielectric strip propagating a

millimeter wave signal received and mixed with the transmitting antenna and attenuating the millimeter wave signal at a non-reflective terminal end disposed at a front end of the fifth dielectric strip;) claim 17 and a mixer portion 82 for generating an intermediate frequency signal by mixing part of the millimeter wave signal and a received wave, the mixer being made by placing an intermediate portion of the second dielectric strip near an intermediate portion of the fourth dielectric strip so that the second and fourth dielectric strips are electromagnetically coupled to, or joined to each other, wherein the first, second, third, and fourth dielectric strips; the variable capacitance diode; the circulator; and the mixer portion are interposed between the parallel planar conductors, and wherein, of the first to fourth (or to fifth) dielectric strips, at least one is a non-radiative dielectric waveguide. The dielectric strip comprised of a ceramic material. The ceramic material including a complex oxide comprising Mg, Al and Si as a main components and having a Q value of 1000 or above at a measured frequency of 60 GHz and the composition of the complex oxide by mole ratio is expressed by the following formula: xMgO - yA1203 * ZSi02 (wherein x, y and z are numbers satisfying the x + y + z = 100 mole %, x representing 10 to 40 mole %, y representing 10 to 40 mole and z representing 20 to 80 mole %). (see figures 6-13 and column 4 line 38 through column 9 line 45 and column 20 line 15-27)

Thus Kii et al is shown to teach all the limitations of the claim with the exceptions of dielectric strips having a .1 to .3 mm wide chamfer , the chamfer having flat surface or convexly curve surface , the open pore ratio being 5% or les (or 3% or less) and circulator comprising a ferrite disk.

Tanizaki et al show a dielectric strip with chamfer. See figure 17

One skilled in the art, at the time of the invention, would have it obvious having dielectric strip line having chamfer and for the chamfer to be .01 to .3 mm wide and for the chamfer to have a flat or convexly curved surface in order for the dielectric strip to conform to the grooves in the conductive plates.

Fujimaru et al shows a ceramic having open pore ratio being 7% or less. Fujimaru et al teach there is no need for performing sintering for long hour. As a result, reduction in the manufacturing cost can be achieved and dielectric ceramic having a higher Q can be manufactured stably. (column 3 line 7-29)

One skilled in the art at the time of the invention would have found it obvious to have the open pore ratio of 5% or less or 3% or less, since it have been held that where the general condition of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves routine skill in the art.

One skilled in the art at the time of the invention would have found it obvious to replace the general circulator of Kii et al with the ferrite disk circulator of Nagao since examiner takes notice of the equivalence of the ferrite disk circulator and the general circulator for there use in the communication art and the selection of any of these known equivalents to provide distribution would be within the level of ordinary skill in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly E Glenn whose telephone number is (703) 306-5942. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (703) 308-4909. The fax phone numbers for the

organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Kimberly E Glenn
Examiner
Art Unit 2817

keg
February 21, 2003

Robert Pascal
Supervisory Patent Examiner
Technology Center 2800